DOCUMENT RESUME

ED 307 860 IR 013 840

AUTHOR McNeil, Donald R.
TITLE Status of Technology in Higher Education: A Reassessment.
PUB DATE 30 Sep 88
NOTE 15p.; Paper presented at the Annual Conference on Interactive Technology and Telecommunications (2nd, Augusta, ME, September 30, 1988).
PUB TYPE Viewpoints (120) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Access to Information; *Adoption (Ideas); *Computer Assisted Instruction; Cost Effectiveness; *Educational Technology; Higher Education; Interaction; Multimedia Instruction; *Teacher Attitudes; Technological Advancement

ABSTRACT

This paper identifies policies, programs, principles, and problems involved in the use of technology in education, which is described as currently minimal. The following topics are discussed: (1) indicators of the pressure on higher education to adopt a less resistant approach to the use of technology; (2) the progress that has been made in the past few years in the use of educational technology; (3) reasons why there is so much resistance to technology usage in colleges and universities; and (4) requirements that must be met by the institutions if students are to become involved and comfortable in the process of learning about technology. A concluding statement argues that individuals as well as institutions must begin to concentrate on how best to incorporate the use of technologies into the learning environment--and that once inculcated in the educational system, technology will not only alter our way of learning, but will change the society in which we live. (CGD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED307860

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Marjorie Webster
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

STATUS OF TECHNOLOGY IN HIGHER EDUCATION: A REASSESSMENT

Presented by
Donald R. McNeil
Senior Program Officer
Academy for Educational Development
Washington, D.C.

Second Annual Conference on
Interactive Technology and Telecommunications

Augusta, Maine
September 30, 1988

Copyright © 1988

Three years ago, in Paris, I presented a paper on "The Status of Technology in Education in the United States" to a small group organized by the Government of the Netherlands and the European Institute of Education and Policy.

The assignment by the Dutch Government, which was then planning a full-scale review of how to use technology in its educational system, was for me to soar above the conflicts and problems of the every day world of educational technology and give my own biased but global view of what was going on in the United States. They wanted this wonderfully free and wide-ranging assessment to include not only an overview of what was going on, but some critical analyses of the problems, obstacles and opportunities that lay ahead for those who would use technologies in their educational systems.

As I floated over the educational landscape, I was grateful for the opportunity to stand back and take a look at the new information technologies which I think will ultimately alter the way we learn in both the structured and unstructured parts of our lives. My sojourn was, indeed, an intellectual

IR013840

BEST COPY AVAILABLE

free fall uninhibited by the gravity of other people's opinions or the weight of the collective conscience and attitude of the higher education community.

In reviewing that paper in preparation for this conference, I was struck by the fact that with a few exceptions, the use of technology in education remains minimal. The structural, attitudinal and social obstacles to technology usage endure. And set against the broader frameworks of productivity, the need for intellectual renewal, and rising expectations, the United States woefully lacks the determination to match resources and people with even existing technologies.

For education, technology can improve access, raise quality, update the knowledge pool, and facilitate research. It can help individualize instruction, afford educational opportunity at the time and place convenient to the learner, provide rapid feedback, furnish access to remote data bases, and enhance counseling and evaluation. Telecourses, video conferencing, the videodisc, the electronic blackboard, computer networking and conferencing telephone hookups, and voice-data transmission can be used separately or together to modify the delivery system.

Yes, technology is a "hot" subject. To hear the thunderous noise coming out of academia, one might think we had fully integrated all these latest technologies with our pedagogy and our curriculae. But we have not. We have

experimented some, but even those are extremely limited in number and scope. The vast majority of administrators and faculty simply have no sense of the implications or the possibilities of using technology to teach. They either have ignored it or stubbornly resisted it.

Those critical conclusions are relative, of course. But they are relative to what should and could be done with technology. Within that perspective, we have gone backward.

There are signs to indicate that in the next two decades great pressures will force higher education to adapt a less resistant approach.

First, <u>elementary and secondary students are adapting to the new technologies</u>. Children now entering the first grade have thousands of hours of television behind them. Technology is already an integral part of their lives. In elementary schools they are exposed to the computer. By the time they are in high school they have come to know the television, the computer, the telephone and the tape recorder, all of which have become an essential part of their lives -- both in school and out.

Second, <u>the business world will create additional outside pressures</u>. With its own uses of technologies ever expanding, and with the reduction of costs and the development of a mass market in the schools, business is vitally interested in how colleges and universities adapt to the new technologies.

It is true that the computer, especially, has been

employed in a variety of ways for administrative purposes. It is also true that the computer is widely used in specific disciplines in the sciences, engineering, and agriculture. But the majority of the faculty by a large margin continue to resist (or are apathetic about) the advent of the computer as an instructional and advisory tool. An even larger number scorn the use of video.

There is no doubt that some progress has been made in the past few years. Let me list a few advances that are apparent even since the 1985 paper.

First, computers have become much more user friendly, thus luring into the system a number of people who have been fearful of taking that first step. Yet some of the operations (and the documentation) still seem to be designed for engineers or mathematicians alone.

Second, computers have become more compatible. Cooperation between major hardware and software companies to make their products compatible has alleviated many of the problems. But we are far away from universal compatibility.

Third, more good software is coming on to the market. The educational market is beginning to attract an increasing number of software producers -- especially from faculty members and small software houses specializing in education. Yet too many of the products are poor in quality, narrow in outlook, and untransferable to another academic setting. In video, there has been only a relatively slight increase in the

number of quality materials; the trend, instead, has been to video the programs live, using "talking heads" with some augmentation of graphics. Most of these are not usable other than at the home institution.

Fourth, access has been expanded significantly. The steady development of multi-channel cable systems, the enormous expansion of the number of VCR's in the home and in schools, the continued evolution of direct broadcast satellite facilities, the creation of telecommunications consortia for one-way and two-way audio and video, the increase in the use of fibre optic cables, as well as utilizing the telephone as a supplement for the other media, the operation for rural areas and special audiences of ITFS stations (Instructional Televison Fixed Service), and the huge growth in networking among computers, all have garnered new audiences and promoted new uses. Because these are all relatively new, we have no concrete evidence of whether the ideas will spread and be adopted.

Fifth, there has been some movement toward combining the media -- audio with visual, visual with text, and text with data. These mixtures and blends, though, occur more frequently in highly publicized experiments affecting a small number of people than in every day working situations. The logistics of these complex uses have not yet been worked out. Moreover, the huge difficulties of teaching two or more technologies should not be ignored. Nor should the problems

posed by having to inter-relate two technologies to the subject matter AND to each other be avoided. Technology training can be very complex, especially for those coming new to the system.

Still, these experiments in multi media usage expose us to what the future may hold for us.

So, in these five areas at least -- user friendliness, computer compatability, good software, accessibility, and combining the media -- we can see some progress almost on a year-by-year basis.

****

Why then, if there has been progress, is there so much resistance in colleges and universities? There are several reasons.

The first set of reasons revolves around structure. Universities by their very nature are conservative organizations, dedicated to preserving the wisdom of the ages. The experience and training of faculty and administrators continue to be in the traditional mold. In this setting, change comes slowly.

Moreover, faculty members have emerged from traditional patterns of instruction themselves. They replicate what they know best. Very few have had exposure to the new technologies.

In addition, control over the curriculum and mode of instructional delivery is almost entirely at the departmental

level, and the types and standards for delivery systems can vary from department to department, or division to division, or school to school, within the institution. Introduction of a technology-based delivery system faces uneven responses.

Lastly, in most institutions, there is little in the reward system to encourage faculty to become involved with technology. Neither salary increases nor credit toward promotion or tenure are generally offered or given to those who might become involved in utilizing technology either in the classroom, in research, in advising, or in distance teaching.

The second set of reasons why technology has not prospered in colleges and universities has to do with attitudes. Faculty members are basically traditional and institututionally conservative intellecturals. Many of them are contemptuous of technology or any other mode of teaching that differs from what they are accustomed to. Some professors feel threatened with the loss of employment; others are ashamed that they do not understand the technologies. And others are simply jealous.

Turf too often becomes more important than teaching. Critics operate on the fundamental assumption that "if it wasn't made here, it's no good."

But the overriding obstacle to converting faculty members to the uses of technology is their perceived fear of technology. Long accustomed to being an authority figure, a

faculty member finds it difficult to be placed in a position to have to ask so-called "dumb questions" about how a computer works, or why he or she cannot get it to function properly.

One professor I know was given a computer to use with the hope he could convert other faculty members to using it, too. "They just would not change," he mourned, "but then they never change their lecture notes either."

For those faculty members taking the first step of saying, "Yes, I want to learn," a great many have become ardent advocates of technology for the classroom. It is the first step that seems to be the most difficult.

The third major factor has to do with cost and cost effectiveness. Even though costs have gone down dramatically, the price of a computer is still high for the average wage earner. For the institution, costs are high, too. At a time when the pressures for economizing and cutting back are in vogue, the costs of truly computerizing an operation seem prohibitive. Even though prices have decreased in recent years, the total outlays required to make technology work in the institution can be staggering. The costs can be even more staggering if the wrong system is selected or if individual units begin to purchase hardware and software that is incompatible with their counterparts.

In addition there are other costs, some of which are similar to support costs for traditional instruction. Hardware and software costs are only the beginning. Staff

support -- both technical and academic -- is essential as are telephone lines, good training programs, and connections to data bases and the library.

But there is another side to the cost question. Technologies can save money as well as add income. Travel time and costs can be curtailed, productivity enhanced, and access by new students increased.

The cost effectiveness issue, however, is still debatable. A few studies indicate that once a system is up and running, it can pay for itself. But most studies (and assumptions about the use of technologies) call for the individual user to bear the cost of the hardware and software. On the other hand, inexpensive terminals within area networks and standard VCR equipmnent on campus and in the dormitories will continue to bring the costs down over a period of time.

Amidst all these hopeful signs, however the problem of catering to the elite remailns. Only those individuals who can afford a computer, or who attend a school that can afford widespread use of computers, (or have the inclination to use computers)will receive the training they need to fit into tomorrow's society. Technology may, unfortunately, be aggravating the distance between the "haves" over the "have nots."

****

But let us shift for a moment to the genuine target of our concerns, the student. All the technology in the world

will not help if the student does not become involved in the learning process and feel comfortable about it. Technology for the most part alters the delivery system -- the way in which the student receives and collates information, trades ideas, and interacts with other students and faculty. Yet technology has the power to go beyond information and idea exchanges. It can enhance the student's power of analysis, improve the student's capacity to think critically, better the student's writing skills, and enrich the student's power to develop independent judgments.

But for all those good things to happen to the student, certain considerations will have to be met.

First, the institution must decide what the technology or technologies are to be used for. Is the instruction by technology to supplement and enrich? Or is it to improve access to new audiences? Is it to reach distance learners? Or is it to impove the quality of existing instruction? Too often, these objectives are not clearly defined.

Second, the institution must decide which technology is best for which students, for which courses, and for which objectives. Unfortunately, it does not often work that way. A person gets hooked on a particular technology and then begins looking for a problem requiring that solution. It should be the other way around. The problem should be stated first. Then the appropriate technology to solve that problem can be sought. Issues of effectivenesss, cost, relevance,

potential, and compatible environment, can be measured against each technological service to be rendered.

Third, to the degree possible, the technology should be interactive. Self contained audio and visual programs are passive. Two way audio, the videodisc, and the computer's electronic mail and computer conferencing programs hold out the hope that, in combination with audio and video, they can be more interactive than the traditional courses taught before a lecturn.

Fourth, the pedagogy should be different than that used in traditional classes. One cannot "lecture" on a computer; the students would be bored. One has to use a seminar approach, evoking questions, discussion, and debate. The faculty member must be able to involve the student in the learning process in a different way. In some ways, the faculty member's role will change -- from a lecturing authority figure to a facilitator of an exchange of ideas leading to an understanding of the subject matter.

Fifth, The support system will change. Technical experts will be needed to keep the technology functioning correctly and to mount those programs requiring technical facility. Faculty members will be available for consultation and advice (even if in an asychronous mode) to a degree and in a way they are not now available.

Sixth, wherever and whenever feasible, the technologies should be combined. Electronic mail or computer conferencing

supplements video and makes it interactive. Two way audio is an inexpensive way of making video sattelite broadcasts interactive. The videodisc can combine both picture and text. The electronic blackboard can supplement video and audio tapes and the telephone can be of general use in supporting the other delivery methods.

Seventh, training is the key to success. The training factor pervades all parts of a technology-based delivery system. With computers, students, faculty and admnistrators must all be taught to learn how to use them, how to overcome initial fears, how to become comfortable with them. Faculty need help in changing their courses around to meet the requirements of more involvement and discussion by the students rather than straight lectures by the faculty. They also need training in integrating the new demands of the technology with their subject matter materials. Training is probably the most important factor in developing technology based educational programs.

****

In identifying these policies, programs, principles, and problems, we try to outline the realities facing us as we try to broaden the commitment of our colleagues.

But often, looking to the future, we become somewhat unrealistic. We talk glibly of the electronic society and the merging of technologies as if they were loose at hand. We point with pride to the numerous experiments, and the sizable

number of small programs that are in progress. Added up, they seem more potent and more abundant than they really are.

As a matter of fact, despite our gains, we have not even come close to making a difference in the lives and learning experiences of the American people. Millions of people have not and will not touch a computer. Thousands of corporations have not utilized technologies in their training programs. Hundreds of thousands of profressors and teachers and administrators will not accept the services rendered by these technologies. Resources are limited; training is for the most part inadequate; but worst of all, knowledge and comprhension and skills among the leaders is in dismal short supply.

Hardware, software, staff development, training and know how will not come easily. They are costly and complex. Any institution starting down the technology trail should face that fundamental assumption straight on.

But the important corollary question is: What will happen if we do NOT move to embrace the technologies? There are signs that these fast developing technologies are going to alter the learning environment to such an extent that the old institutional models of campuses and classes and lectures and schedules and timetables and tests as we know them will not survive in their present forms.

Yet, somewhat paradoxically, we know that these technologies are not for everyone. Classes and colleges and courses in some form will most certainly endure. Some people

simply will never adapt to the use of technologies.

But we also know that even with limited objectives and the restrained use of technologies in the near future, that a revolution is going on, that even the most traditional of learning experiences will feel the impact of technology on how they teach, what they teach, when they teach and where they teach.

So it is imperative that individuals as well as institutions begin to concentrate on how best to incorporate the use of technologies into the learning environmenmt. This may mean one small project or activity ty a single department or a solo professor. But the first step needs to be taken.

From that small beginning, one can build slowly, allowing time for planning and staff development to do the job.

Throughout these early activities, emphasis must be placed on the problem first, then on how technology can help solve that problem.

Technology will not just alter our educational models and our way of learning, it will, once inculcated in the educational system, will change the whole society we live in.

****